

**What is claimed is:**

1. A method for crystallizing a human beta secretase molecule or molecular complex comprising:
  - preparing purified human beta secretase in the presence of a peptide mimetic inhibitor; and
  - crystallizing human beta secretase from a solution having a pH of about 3.5 to about 5.5.
2. The method of claim 1 wherein the salt is selected from the group of sodium chloride, ammonium sulfate, magnesium sulfate, lithium sulfate, and combinations thereof.
3. The method of claim 1 wherein the solution has a pH of about 4.2 to about 4.5.
4. The method of claim 1 wherein the solution comprises a buffer having a  $pK_a$  of about 3 to about 6.
5. The method of claim 1 wherein the glycol is selected from the group of PEG, PEG-MME, PEG-DME, and combinations thereof.
6. The method of claim 1 wherein the solution further comprises a salt.
7. The method of claim 6 wherein the salt is present in a concentration of about 0.01 M to about 0.5 M.
8. The method of claim 1 wherein the solution includes up to about 20 wt-% organic solvent.

9. The method of claim 8 wherein the organic solvent is DMSO.
10. The method of claim 1 wherein the solution further comprises up to about 20 wt-% ethylene glycol or glycerol.
11. The method of claim 1 wherein the beta secretase is present at a concentration of about 1 mg/ml to about 80 mg/ml.
12. The method of claim 1 wherein the peptide mimetic inhibitor is present at a concentration of about 0.1 to about 10 mM.
13. The method of claim 1 wherein the solution further comprises about 5 wt-% to about 50 wt-% of a glycol.
14. The method of claim 1 wherein the human beta secretase is isolated from mammalian cells.
15. The method of claim 14 wherein the mammalian cells are CHO-K1 cells.
16. A crystal of beta secretase having the trigonal space group symmetry P32<sub>1</sub>.
17. A crystal of beta secretase comprising a unit cell having dimensions of a, b, and c, wherein a is about 92 Å to about 132 Å, b is about 92 Å to about 132 Å, and c is about 90 Å to about 130 Å; and  $\alpha=\beta=90^\circ$ , and  $\gamma=120^\circ$ .
18. A crystal of beta secretase having the trigonal space group symmetry P32<sub>1</sub> and comprising a unit cell having dimensions of a, b, and c, wherein a is about 92 Å to

about 132 Å, b is about 92 Å to about 132 Å, and c is about 90 Å to about 130 Å; and  $\alpha=\beta=90^\circ$ , and  $\gamma=120^\circ$ .

19. The crystal of claim 18 having amino acid sequence SEQ ID NO:1.
20. The crystal of claim 19 having amino acid sequence SEQ ID NO:1, with the proviso that at least one methionine is replaced with selenomethionine.
21. A method of producing human beta secretase, the method comprising expressing the human beta secretase in a mammalian cell line.